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Economic Research Service, U. S. Department of Agriculture ERS–423

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FARM PRODUCTION ECONOMICS

MARKETING ECONOMICS

ECONOMIC AND STATISTICAL ANALYSIS

FOREIGN REGIONAL ANALYSIS

FOREIGN DEVELOPMENT AND TRADE

ECONOMIC DEVELOPMENT

NATURAL RESOURCE ECONOMICS

## FOREWORD

**ERS provides economic information to the public, Government agencies, and the Congress.**

Our task is to supply these groups with background for understanding the changes taking place on farms, in related agricultural industries, and in rural communities.

Our studies are more than collections of information. Data are carefully developed, tested, and analyzed to appraise future prospects and to evaluate the consequences of alternative courses of action. ERS research is timely, relevant, and needed.

ERS provides information farmers and agribusinessmen need to make everyday decisions. Much of our research helps people living in rural communities, who are neither in farming nor in agribusiness. And a lot of it aids consumers, too.

Our studies and staff are increasingly called on to supply economic appraisals useful in improving operating programs of other USDA agencies. Federal agencies outside USDA often arrange for us to do research or related special services. ERS staff members frequently serve as consultants to international organizations or foreign governments.

We perform special studies for the Congress, which may use the information to guide legislative proposals.

Cooperation with others helps us gain, as well as share, experience and information. It helps make our research more relevant to current and future needs.

Most of our cooperative work is done with agricultural economists in State Agricultural Experiment Stations. We also work closely with USDA's Statistical Reporting Service, whose vast resources for data collection are drawn on for many purposes. We value highly our long history of fruitful collaboration with these people.

**About 300 research reports a year present our findings to the public.**

Over 80 of these are situation and outlook reports. In them, we report and analyze the current economic situation for food and other agricultural products, financing, marketing, demand and prices, farm income and costs. Based on careful analysis, we present outlook—forecasts of possible future developments.

Our National Agricultural Outlook Conference, started in 1923 and held annually since, is well attended by university econo-

mists, journalists, and agribusinessmen. It has helped stimulate many regional and commodity outlook meetings in which our economists play a prominent part.

**Economic research has a long and distinguished history and record of service in USDA.**

Economic research had its beginning long before ERS was formed. It started in the Department of Agriculture in 1905 with studies of farm management. Work expanded into research on marketing, prices, farm income, and farm population. This growth resulted in the organization of the Bureau of Agricultural Economics in 1922. Various organizational changes occurred until ERS was organized in 1961.

**Our ERS researchers are widely respected.**

They're recognized leaders in their field. They're often asked to present papers at professional meetings of their colleagues. And groups who need their special talents frequently call on our staff as consultants or speakers.

Our researchers make important contributions to basic research and methodology, in addition to their applied studies. Through their addition to the fundamental knowledge of economists and their improvement in research techniques, the investment in their work is multiplied many times over its original cost.

We're proud of the work of our seven divisions and of the people in them—from the internationally known economists to the newest clerks just out of high school. We're proud of the way many of them continue to develop their skills and further their education, on their own or through USDA study programs.

By working together as a team—competently, imaginatively, and with dedication—they accomplish more than the sum of seven divisions.

**Our job doesn't end with research.**

It includes helping others understand and apply our findings, and working with them to make our research more relevant and timely.

It's with pride that we present this brief glimpse into ERS at work.

M. L. UPCHURCH, Administrator
Economic Research Service

## FARM PRODUCTION ECONOMICS DIVISION

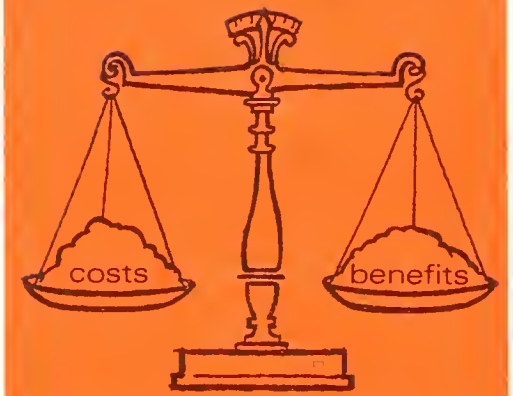
*U.S. agriculture is highly diverse and is changing rapidly.*

Our 3 million farms include extensive range livestock ranches and intensive specialty crop farms. They include weekend hobby farms and large, highly capitalized enterprises. Most are family-operated businesses that provide a job and a living for farm people.

A few decades ago, U.S. farming was characterized as a self-sufficient, semisubsistence, family-employing enterprise subject to central commodity markets. In a relatively short time, it has been transformed to a modern technology-using interdependent enterprise that is exploring a variety of new marketing arrangements.

Now, almost all of U.S. farming is commercial—in the sense that all products flow through commercial channels. Very little subsistence farming remains.

On the other hand, many farmers earn off-farm income from another business, wages, or investments. In fact, total off-farm income of farmers almost equals *net* returns from farming.




Analysis of Farm Programs

*The changing structure of farming is a major line of inquiry.*

It includes: Geographic shifts in production; number, size, and organization of farms; and ownership and equity in land and other production resources.

Cotton has moved to the irrigated Southwest, beef cattle raising into the Southeast, soybeans to the South Central region, and grain sorghums to the Western Corn Belt. We need to know what caused these shifts, and what future changes in interregional competition can be expected.

People are asking: Will we continue to have a majority of family-scale farms? Or, will large-scale units, including corporations, dominate our agricultural scene?

To answer these questions, we're studying a sample of large-scale, incorporated farms—their origin, their business organization and management, their farming practices and effi-

ciencies, and their buying and selling arrangements. We're also studying competitive advantages of full-scale, family-type farms.

We need to know which are the viable farms—why will some survive economic changes and prosper? We also need to discover the characteristics of those not likely to endure.

Another dimension of the changing structure of agriculture is the sharing of equity and ownership of farm assets between farmers and nonfarmers. The nonfarm sector has an increasing stake in farming capital. For example, who owns the land can affect distribution of farm income, Government payments, and land value appreciation. Also, the size of owners' equities can affect rates of return.

Emerging research questions are: What is the structure—size, number, and cost—of the cattle feeding industry? What are the interregional competitive aspects? What is the pattern of the industry likely to be by 1975? We're conducting this research cooperatively with land grant universities in several regions of the country.

*Some of our research is concerned with availability, productivity, and cost of production resources.*

We keep tabs on manufacturing plant capacity. And we keep track of production of feed, fertilizer, farm chemicals, tractors, and specialized farm machines.

Trends in livestock feed supplies, changes in feed-conversion efficiency, and feed requirements of the U.S. livestock industry are studied.

Our analyses of the distribution and use of fertilizers by regions and crops include studies of crop yield response and economic returns from fertilizer.

We have made two national enumerative surveys of pesticide use by farmers. This work is continuing.

Farmers are substituting mechanical power for human labor—not a simple process. It often means they adopt entirely new varieties and cultural practices. Sometimes it requires a completely new package of production technology and shifts in production areas. To make these substitutions intelligently, farmers need

reliable information to compare productivity and costs. That's what our research aims to provide.

*We have a comprehensive system for information gathering and analysis of the rapid changes in farm real estate values.*

Farmers, lenders, and other decision-makers need this information to plan effective use, transfer, and financing of farm real estate.

*Our research in agricultural finance has several key dimensions.*

Modern farming has high capital requirements. Many farms involve capital investments of $250,000 or more. Consequently, we find farmers using new and unique procedures to obtain "use rights" to the production resources they need. These devices include renting (instead of owning) land and machines and even cows—or custom hiring of seeding, spraying, harvesting, and so on. Custom hire sometimes includes the whole package of field operations.

Farm financial management research studies rapid equipment depreciation, tax management, and capital appreciation. Strategies for getting started in farming, for firm growth, and for transfer of farm properties between generations are also investigated.

*We study year-to-year changes in costs and returns on different types of farms.*

We use the "whole farm" approach. For some types, the series date back 30 years. We plan to expand the analyses to include a "financial balance sheet" for each major farm business type. We'll also compare returns to resources used in farming with alternative uses of those resources.

*Farm programs often affect more than price and production of specific crops.*

They sometimes have impacts beyond those originally intended. For example, land diverted from a crop may produce increased forage and expand livestock production. Solving one commodity's problem may have impacts on others.

Thus, we strive to fill a need for continuing appraisal of the consequences of alternative ways to deal with aggregate farm production and commodity price problems. The effectiveness—and cost—of present and alternative farm programs are of interest to everyone.

## MARKETING ECONOMICS DIVISION

*Agricultural marketing is big business.*

How well the marketing job is done makes a big difference to both consumers and farmers. The costs of marketing—assembling, transporting, processing, distributing — represent over two-thirds of consumer food expenditures.

Our U.S. food marketing bill now amounts to about $60 billion annually. Additional billions can be added to the marketing bill for fiber and other nonfood uses of agricultural products.

The major goal of marketing economics research is to analyze how well the marketing system is performing and to look for ways to improve it.

Our research program is built around changes in the marketing system and what causes them. We check the effects of change on the income and bargaining power of all participants, including farmers, marketing firms, and consumers.

We analyze such diverse subjects as costs and margins, price and pricing policy, farmer bargaining power, interregional competition, transportation, concentration and competition of firms, and market development. We give major attention to changes in the marketing system and how they affect farmers and consumers, so adjustments can be made efficiently and smoothly.

To analyze the many activities of the marketing system requires reliable data, a variety of research tools, computers, and highly trained personnel. The work is organized along both commodity and functional lines, attacking problems primarily of national scope and significance.

*Just as we must develop new knowledge, we must make maximum use of proven ideas.*

People always need practical answers to the many problems that develop as markets and products change.

The marketing spread—the difference between what farmers and retailers get for farm foods—has been an indicator of market performance for over 25 years. Along with the total food marketing bill, these data and the factors behind them point up the relationship between what farmers receive and what consumers pay for farm foods. Widely quoted, they help develop better understanding of the food industry and its services.

However, we are continually improving our measures of market performance. Research continues on the improvement of existing measures such as price spreads, technological progressiveness, and productivity. We're also interested in developing new indicators of performance.

Other practical problems we've researched include the most efficient size for livestock auctions, economies of scale in feed manufacturing, and comparisons of cotton ginning capacity and costs.

Development and perfection of research tools is a vital part of any research program. Utility theory proved useful in demonstrating how decisions can be made to maximize returns in soybean processing and storage. A new statistic—marginal $R^2$—and equations for computing it were developed that will give us and others a simpler method to determine how different variables influence performance.

*Pricing and transportation are among the important problems being researched.*

Research in this area ranges from a special analysis of the egg pricing system to continuing studies of transportation economics.

We worked with 13 State Experiment Stations to examine the egg pricing system and to evaluate alternative ways to price eggs. This enabled us to enlist some of the Nation's top research talent in different phases of the study.

Transportation, location, and growth studies help us keep track of interregional competition. We recently studied the performance of exempt motor carriers and competition be-

tween truck, rail, and barge transportation. Findings are used in many ways: Evidence for freight rate adjustments, evaluating and improving distribution, or pointing up the need for public or private investment for marketing facilities or services.

*We look for ways farmers can strengthen their bargaining position.*

Our marketing economists developed a model of the corn-hog economy. It can guide promotion to keep supplies from building up. This would help stabilize prices. It can also be used to check effectiveness and returns of promotion.

We recently evaluated poultrymen's returns under different types of contracts with input suppliers and marketing firms. This helped spell out cost-return relationships and show when contractual or independent production would be most profitable.

*Marketing research wouldn't be complete without consumer studies.*

They help producers and marketing firms learn what their customers want. They provide information to help guide consumers.

For instance, purchases and characteristics of buyers and nonbuyers of floral and nursery products were recently recorded and analyzed. Part of the overall study was supported by a trade group. Its results will help tailor products and services to consumer needs.

USDA's Agricultural Research Service developed a new process to vacuum-dry whole milk. They asked us to test market response to this new product. We found both retailers and consumers (especially campers) like it.

ERS developed the first data on the size and nature of the growing away-from-home food market. The food service industry supported this research financially and is making widespread use of this information. Further details on food requirements and sources of supply for this market are now being tabulated.

We also conducted special studies of prices and qualities of food sold by chainstores in high- and low-income areas. We found greater differences between stores within an area than among stores of individual chains serving both areas.

## ECONOMIC AND STATISTICAL ANALYSIS DIVISION

*We keep watch on the general economy because agriculture is so much a part of it.*

How would an 8-percent increase in fed cattle marketings affect producers, processors, and consumers?

What would happen if farmers cut the pig crop 5 percent?

Or if they produced another record feed grain crop?

Our commodity analysts continually study the factors that determine how much food and fiber will be available for domestic use and export. They analyze demand and forecast prices.

Commodity situation reports emerging from these analyses tell at a glance what the outlook is for coming months. They provide useful and timely information to aid decisionmakers at all levels.

In addition to commodity situation and outlook work, our economists develop and test statistical models for

use in outlook appraisals, long-run projections, and program analyses. These models help them and others analyze factors affecting the short- and long-range supply, demand, price, and income prospects for agricultural commodities. They also help evaluate the effects of alternative farm policies and programs.

*Timely and accurate statistical information and analyses of the farm income situation are essential for many purposes.*

To derive gross farm income, we estimate marketing receipts for 150 different farm products, get information on Government payments to farmers, and add the imputed value of farm home consumption and gross rental value of farm dwellings. To figure net farm income, we subtract estimates of about 40 different farm production expense items. We do this for each State, as well as the United States as a whole.

The changing structure of agriculture is also analyzed. We annually estimate the number of farms by value-of-sales classes. This entails

measures of the average realized gross and net income from farming, average income from off-farm sources, and total income per farm operator family. These estimates reveal many aspects of the farm income situation and farmers' problems and opportunities not apparent from the aggregates and averages.

Development of meaningful measures of the parity returns position of farmers is a new challenge. Illustrative measures of parity returns have been developed for all farms combined, for several types of farms, and for the different sales classes.

There are many possible ways to calculate parity returns. Recent efforts have centered on returns under a landlord standard (returns obtained on rented farmland) and under a stockholder standard (measured by the dividend yield of common stocks equal in value to the capital invested in farming). Measures with and without capital gains have been included under both standards.

*Our analyses must be broad.*

We've developed transaction tables

of interindustry sales and purchases between agriculture and other sectors of the U.S. economy to measure interrelationships.

In addition, a number of macromodels are constructed to measure how different economic forces affect agriculture. Appraisals of current trends and future possibilities are made on both short- and long-term bases.

These include: Effect of money supply and monetary policy on consumer and investment demand; extent of plant utilization; proposed Federal budgets and the multiplier coefficients of Government surpluses and deficits; flow of gold and balance of payments; and how taxes affect farm prices and incomes.

*Food consumption analysis plays a key role in economic research.*

Much of this work is concerned with demand for food at the consumer level.

We compute and publish food expenditures and food consumption and supply-utilization indices quarterly, along with short-term outlook for

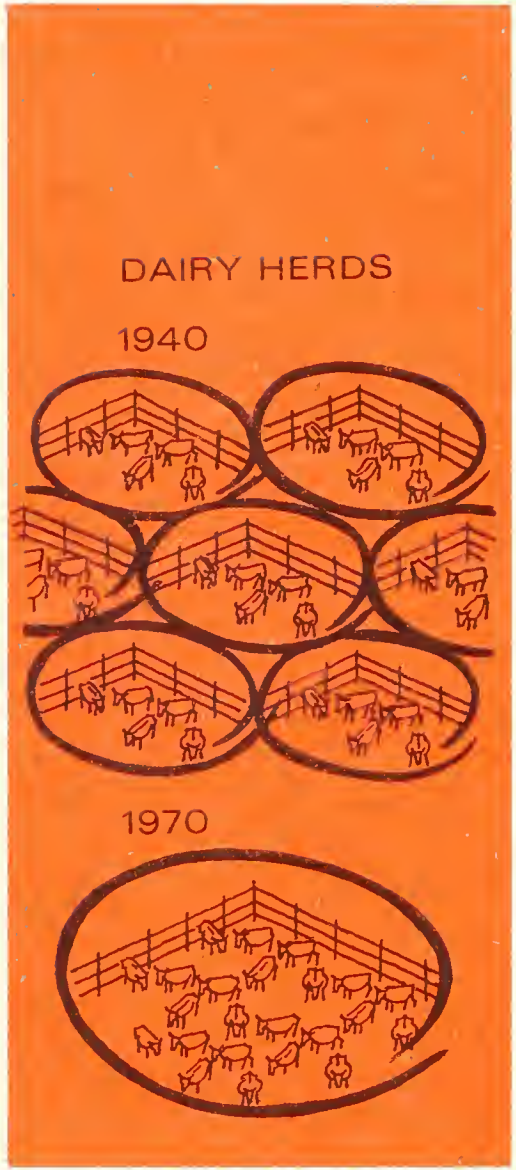
food consumption and retail food prices.

*Agricultural history helps us analyze problems in the light of past events.*

It provides a background for policy evaluation, for new decisions, and for projecting the results of alternative decisions. Continuing reevaluations of price support programs, for example, have called forth a series of studies on various aspects of agricultural adjustment.

We recently reviewed agriculture's contribution to U.S. development and our early technical assistance missions. Agriculture supplied much of the capital for our own early industrialization. Similarly, some nations that received U.S. aid in agriculture have prospered, and are now among our best cash customers for farm products.

Our agricultural history research varies from dating the invention of a particular farm machine to summarizing past legislation affecting a given commodity. Thus, history becomes a part of economic intelligence.




## FOREIGN REGIONAL ANALYSIS DIVISION

*Sizing up the world agricultural situation and long-range outlook is a big job.*

Approaching it country by country and region by region cuts it down to manageable proportions. Even so, there's more to global analyses than merely adding up separate reports of countries and regions.

We have to go through a lot of information from varying sources—from the countries themselves, the United Nations, Food and Agriculture Organization, Organization for Economic Cooperation and Development, U.S. agricultural attachés, our own data bank, and country or area experts.

Then we develop our overview of the world agricultural situation and outlook, compile indices of production, analyze foreign competition, and project intermediate and long-term supply and demand.

Each winter, we publish our review

of the current world agricultural situation and outlook for the coming year. In it, we feature topics of wide concern to U.S. agriculture.

Work is underway to calculate and analyze potential food needs and supplies in most of the world's countries. The next World Food Budget will focus on the less-developed countries (LDCs). Due to be published in the early 70's, its projections will help policy makers, producers, and exporters plan for the future.

*FRAD's orientation is regional.*

Aside from our World Analysis Group and Special Projects Branch, we're organized into four regional branches: Africa and Middle East, Europe and Soviet Union, Far East, and Western Hemisphere.

Regional branches have three functional groups: Situation and outlook, demand and competiton, and long-range outlook. (In addition, the Europe and Soviet Union Branch has a Communist Areas Analysis Group.)

Groups in each branch cooperate closely, since they often use the same data, or base their work on the results

of another group's research.

Let's look at the kind of research they do:

*Situation and outlook groups appraise current agricultural developments and short-run prospects.*

They collect and analyze information on the food and agricultural situation in countries in the region. With that as background, they project short-term outlook on demand for and supply of farm products.

In addition to contributing to the world agricultural situation and outlook report, they prepare more detailed regional reports each spring. To keep that information and analysis up to date, they publish midyear supplements in late summer.

These groups summarize and analyze policies affecting agriculture and farmers' incomes in foreign countries.

They calculate indices of agricultural and food production for each country, to measure trends and compare growth rates.

Computing food balances helps them assess size and quality of foreign food supplies.

The information-gathering and current situation analyses needed for projection of short-term outlook are also basic for other groups' work.

*Demand and competition groups analyze trends in foreign markets.*

This work includes: Evaluating foreign demand and supply of farm products; analyzing other countries' policies affecting agricultural trade; studying their population and income growth; and assessing the effects of changes in overseas markets, consumption, prices, stocks, and trade patterns on U.S. farm exports.

A recent study of Argentina's agriculture exemplifies some of our comprehensive research on major competitors for world markets. Our analysis probed Argentine agricultural production, marketing, and policies. It inspected domestic and foreign demand and Argentina's competitive position in world trade. Against this background and a detailed commodity analysis, we examined Argentine production and export potentials.

Study of Ecuador's trade showed they imported more U.S. wheat, fats, and oils as their exports of bananas and other products rose.

Appraisals like these help clarify U.S. foreign trade prospects.

*Long-range outlook groups analyze future prospects.*

We're particularly interested in implications for U.S. resource adjustment, general agricultural and trade policies.

Meaningful long-range outlook requires special expertise and careful consideration of relevant information.

A world trade and demand model has been developed under a contract with the Agency for International Development (AID) to project long-range demand for commodities produced by LDCs. Formulated in cooperation with our Foreign Development and Trade Division, the analytic framework is being translated into a computer program that will take into account different population, income, and related demand factors. AID will use the results to evaluate LDCs' potential export earnings.

Long-run projections are often done overseas by universities or other research institutions with special facilities or familiarity with problems to be studied. We use P.L. 480 funds for this contract work.

For instance, the Landbouw-Economisch Instituut in the Netherlands studied future Dutch production, consumption, and foreign trade of major agricultural commodities. Particularly important was their analysis of Dutch agriculture relative to agriculture of other European Economic Community (EEC) countries.

## FOREIGN DEVELOPMENT AND TRADE DIVISION

*Our trade research focuses on factors affecting export prospects for U.S. farm products.*

We emphasize markets where rapid economic, political, and social changes may significantly affect our export volume. The EEC and Japan currently receive major attention, with particular stress on potential demand for feed grains, oilseeds, and oilseed products.

Regional trading arrangements and nontariff barriers require continuing attention. We analyze their role and impact in modifying prices, availability of products, and market access.

The EEC, the Latin American Free Trade Association, and the Central American Common Market give trade preferences to member countries. We study how they affect access for U.S. products and estimate the trade consequences of these integration movements.

*Research on U.S. food aid assesses its impact in recipient countries, effects on U.S. commercial trade, and implications to U.S. agriculture.*

These kinds of information and analyses help improve current U.S. programs. They're needed to develop new policies and programs to effectively promote agricultural and economic development and to increase social and political stability.

Nearly half of U.S. economic assistance to LDCs has been in the form of food aid. It amounts to a fourth of the foreign economic aid they get from developed nations.

Recent analyses of U.S. food aid and agricultural development assistance show how these programs helped raise nutritional levels and foster self-help in LDCs. Another recent study evaluated how alternative P.L. 480 concessional sales techniques affected purchases of U.S. farm products.

Food aid statistics are compiled by type of program. Trends are studied. Recipient countries' financial capabilities and foreign exchange positions are included in our continuing analyses.

*Most of our international monetary research has immediate application.*

We analyze agricultural trade to determine its contribution to the U.S. trade balance and overall balance of payments.

In our service work relating to P.L. 480, we supply data on a recipient country's financial position and recommend financial terms for agreements. Recommendations are based on the recipient's balance-of-payments position, level of reserves in relation to imports, international indebtedness, and other economic factors relating to their need for P.L. 480 assistance.

*In addition to our analyses and estimates, we coordinate U.S. and foreign agricultural trade statistics for USDA.*

We collect statistics on world agricultural trade from many different sources for our data bank, and compile indices of U.S. agricultural trade.

These data are used for our analyses of world agricultural prices, volume, and value of U.S. and world agricultural trade (including Food for Freedom shipments and exports to regional trade blocs like EEC). We also analyze the effects of current policies and programs on foreign market expansion, competition, trade agreements, import fees and quotas.

We forecast short-run prospects for U.S. agricultural trade and estimate costs and benefits of agricultural protectionism.

Special studies bring problems and potential solutions into sharper focus. These are published promptly, along with our monthly release of data and analyses of U.S. agricultural trade by country and commodity.

*Foreign economic development research helps other countries, as well as our own.*

It helps underdeveloped nations improve their agricultural productivity, economic growth, and foreign trade.

It provides us with information for planning and implementing U.S. assistance and trade development programs.

We recently analyzed growth in agricultural output—and the reasons

for the increase—in 54 developing nations.

More intensive studies in seven of them enabled us to evaluate the forces leading to their progress. Under contract with AID, our researchers worked overseas for several years, gathering their own data.

These studies yielded generalizations and models that may improve LDCs' use of resources and institutions as they plan and carry out development programs.

*Another focus of our foreign development research is to study how agriculture contributes to overall economic development.*

Analysis of Taiwan's multiphase agricultural development strategy showed how it helped farm output outstrip population growth. It also accelerated national economic progress. Agricultural development was tied in with marketing and industrial growth and increased foreign trade. This helped assure that manpower and capital freed from farming would find productive use in other economic sectors, and thus contribute to overall development.

Just as agricultural development needs to tie in with overall development, farm production can't increase without regard for domestic or world demand.

These studies help us—and LDCs—gear output to effective demand.

Recently completed trade flow matrices for selected commodities produced by LDCs and a world demand model will help us project 1980 trade prospects.

We've found that, as LDCs progress, they become better customers for U.S. agriculture and industry. As their agricultural exports grow, imports of more expensive foods, meats, and feeds rise even faster.

*We also coordinate technical assistance, consultant services, and training.*

Under Participating Agency Service Agreements, we backstop ERS economists on overseas technical assistance or research assignments.

Our economists are frequent consultants to international organizations, like the Food and Agriculture Organization of the United Nations, World Health Organization, and Inter-American Development Bank.

And we coordinate training of foreign nationals in this country to study economics and statistics.

## ECONOMIC DEVELOPMENT DIVISION

*Economic development research emphasizes people and their needs for economic opportunities.*

We study the needs of rural residents, their values, and how they work through local government and other organizations to improve their economic and living conditions.

We measure and record economic and social changes, looking for interrelationships that give clues on the most promising ways to improve communities.

We analyze causes of different rates of economic development for areas and regions.

*People are our main concern.*

Each year, we survey farmers and farmworkers to keep up to date between censuses. The surveys help us spot new trends quickly.

We usually go beyond descriptive surveys. And we must go way beyond studies of farmers and farmworkers

Freedom shipments and exports to

to include studies of all rural people.

Development planners need detailed data on rural manpower, minority groups, population shifts, income, and levels of living. They also need accurate analyses and reliable projections.

We can't just study manpower or income or any other single topic in isolation. Interrelationships among these factors cannot be ignored.

For instance—our projections imply that more than 2 million rural workers are underemployed. Maybe they could be more productive. Or earn more on other jobs. But are other jobs available? Can workers learn new job skills? Would they move to take jobs elsewhere?

There are many similar questions. Each has to be checked out so that development activities will be realistic and effective. In-depth knowledge of socioeconomic conditions is basic to economic development.

*Adequate facilities and services are essential if a community is to be a good place to live.*

They're also closely linked to eco-

nomic development.

If a community has good facilities and services, it's more likely to attract new industry or other employment opportunities.

Adequate services and facilities are more than niceties. Businessmen looking for a new location take a hard look at the community they're considering—just as they carefully calculate marketing, transportation, labor, and other advantages.

Quality and cost of housing are important. Same with health services, schools, water and sewage, parks and recreation.

*What is the process for improving a community?*

Local development groups and government officials on all levels ask this same question.

To help them get answers, we study economic activity, institutions, facilities, services, local governments, and development efforts in rural communities. We measure their level and adequacy, and seek ways to improve and finance them.

Some rural communities can realistically expect reduced population and income. Their needs remain, but their resources are limited.

Rural areas are increasingly challenged to develop community services and facilities that best meet their special needs in our ever-changing society.

This is true in the rural-urban fringe, where change is most rapid. It is as true in the Southeast (where most of the people in some areas are black), as it is in Appalachia or the Ozarks (where most of the people are white). And it is equally true in the many scattered areas where American Indians face the question of becoming Indian Americans. Do they want to? If so, how do they do it?

*Finding how communities improve themselves is one of our economic development research functions.*

We teamed up with the University of Missouri to learn more about the process and effects of area development in Ava, Mo. This cooperative approach helped to increase our local knowledge and to improve interpre-

tation of economic situations.

Ava had consolidated its schools, built some new schools, and installed a new self-supporting water and sewage system.

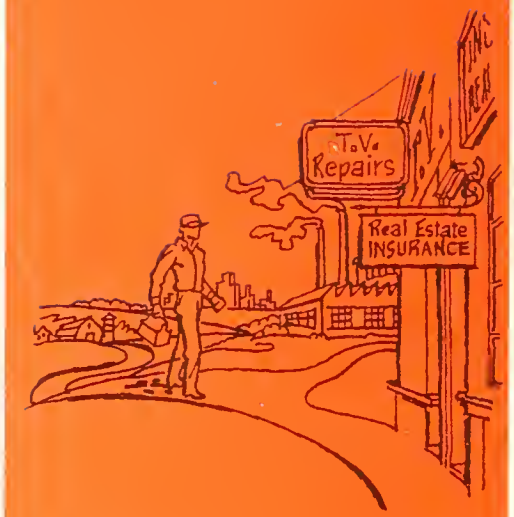
We found industrial growth since 1960 had increased employment in the area. The larger tax base enabled Ava to improve community facilities and services—and lower city and school district tax rates at the same time!

It didn't just happen, though. It took a lot of work and coordination to make the area a better place in which to live, work, and do business.

Lessons learned in areas like Ava will benefit others.

*Unless growth is fairly evenly distributed, it leaves some people and areas further behind.*

Detailed studies of several severely depressed areas probed the intensity and dimensions of rural poverty. The rural poor are not all alike. They have unique problems. Therefore, solutions must vary.




In the Ozarks and Southern Appalachia, for example, most of the poor are white. In the Southeast Coastal Plains and in the Mississippi Delta, most poor are nonwhite. In both Southern Appalachia and the Southeast Coastal Plains, poor families tend to have more children than they can support and more than they want. In the Ozarks, most of the rural poor are older, retired people. In parts of the Southeast Coastal Plains, operators of small farms are often poor—even though they could be classified as "working." A recent survey of the rural poor revealed that three-fourths of the household heads had attained less than eighth grade education.

To describe the problem doesn't answer it. But it's a sound step in the right direction.

Our research strives to find solutions. We try to look at multicounty areas and examine development options for towns and related rural areas.

Research on area development has a high purpose: Providing knowledge

to improve incomes and the quality of life for rural residents. And to make these improvements in ways that actually expand income and living opportunities for other Americans.

## NATURAL RESOURCE ECONOMICS DIVISION

*Although natural resources are abundant, they're not limitless.*

Our changing needs dictate shifts in their use, conservation, development, management, and control.

That's why we study more than the economics of their quantity and quality, distribution and productivity. Their social and institutional aspects are fully as important.

That's why we blend assistance in planning and policy formulation and technical consultation with fundamental and applied research on natural resources.

This diversified approach requires —and benefits from—the teamwork of lawyers, geographers, and planners, as well as economists and statisticians.

*Our land uses keep changing.*

Population grows. Cities sprawl. Superhighways stream out to link them. Land used for crop production declines. Yet, increased productivity enables us to cultivate fewer acres and export more food and feed.

To keep track of these changes in land use, we combine data from the Bureau of the Census and other Federal and State agencies with our own special surveys to prepare an inventory of major land uses. Annual surveys help us estimate current cropland use by regions. We also analyze nonfarm land use and urbanization rates.

We're exploring prospects for the use of satellites for crop reporting. Over 300 other potential agricultural applications of remote sensing have been identified. We're working with a university on how to secure information on our land resources from an orbiting spacecraft.

Analyses of historic trends, current relationships, and foreseeable developments help us evaluate land con-

servation and development needs. And to project land use:

Local planners often need their own special analyses. That's why we recently published our framework for analyzing open space land uses. It helps planners, conservationists, and civic groups incorporate open spaces into area plans.

*There's an urgent need for economic facts on water supplies, uses, and conservation.*

We need facts to analyze problems and evaluate alternative ways to manage and develop our water resources.

We recently helped the Water Resources Council complete a major assessment of the Nation's water resources.

Irrigation accounts for two-fifths of all water used in the United States. Problems pyramid with more people and industries, because per capita use of water is steadily increasing. Our studies of irrigation feasibility and management will help put limited water supplies to their best use.

Economic impacts of watershed projects are evaluated under a cooperative agreement with the Soil Conservation Service (SCS). Each year, we inventory and analyze selected statistical data from SCS plans for over 800 small watersheds. We study socioeconomic impacts of water resource development and how flood plain zoning and different types of structures and land use patterns reduce flood damage and costs.

*Most of our river basin planning is applied economic research.*

It follows logically from our part in interagency-interdepartmental long-range planning for development and conservation of larger water resource regions. Since river basin plans cover smaller areas, they need to be more detailed and specific. At the same time, they need to be consistent with the overall framework plans.

For ERS's part in river basin planning, we assemble data on the area's agricultural economy. We analyze it, evaluate development alternatives, and project the likely economic impact of installed structures and other resource development. For example,

linear programming was used to evaluate economic impacts of developments in the White River Basin. It highlighted differences between using regional benefits and national needs as bases for justifying projects.

Planning studies like these help direct public agencies' work and investments toward the most economic alternatives. Among the many Federal and State agencies we cooperate with in these studies are the Corps of Engineers, Bureau of Reclamation, Federal Water Pollution Control Administration, and Office of Business Economics.

*Changing land and water uses require changing resource institutions.*

We investigate the economic and legal impacts of water rights, zoning, planning, and other resource institutions. Our comprehensive studies facilitate wider adoption of the most effective measures.

Our study of special districts for developing and managing natural resources ranges from inventorying the authorities and functions of Federal, State, and local water organizations

to evaluating special districts' investment decisions.

We analyze how ownership patterns, contracts, and other legal devices affect resource control and distribution. Our analyses of over 400 vertical integration contracts showed shifts in entrepreneurial functions varied considerably by type of enterprise.

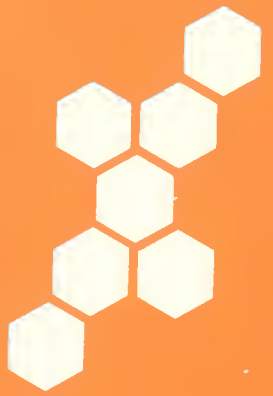
We also appraise the effects of natural resource institutions, policies, and programs on income distribution. One such survey indicated that net benefits to Central Great Plains communities from the Great Plains Conservation Program were two or three times net returns to participants.

*Environmental studies are increasingly important.*

Besides studying the impact of outdoor recreation on resource uses, we also assess its effects on jobs and incomes. An econometric model was designed to relate recreation demand to different kinds of reservoir developments. Other studies include public and private recreation enterprises.

We're developing and evaluating economic information on agricultural pollutants and methods for reducing their adverse effects.

Our work on Resource Conservation and Development (RC&D) projects combines technical assistance and applied research: Helping local RC&D project sponsors with economic aspects of their plans; studying economic feasibility of proposals; evaluating economic consequences of projects in selected areas; and helping with program planning and development at the national level.



## Career opportunities are available for qualified applicants.

Each ERS Division offers opportunities for agricultural economists and other social scientists to specialize and to take part in interdisciplinary research of national—even international—importance.

If you want to learn more about your potential in ERS, write: Administrator, Economic Research Service, U.S. Department of Agriculture, Washington, D.C. 20250.

## These publications will help you keep up to date on the work of ERS:

The **Farm Index,** a monthly nontechnical magazine, reports current ERS research in easy-to-read language.

Brief highlights of the latest situation and outlook appear monthly in **Agricultural Outlook Digest.**

Regularly scheduled ERS publications, including outlook and situation reports, are described in our annual **Periodic Reports.**

All other new ERS research publications are listed in our monthly **Checklist of Reports.**

For sample copies, write: Publications Distribution, Division of Information, OMS, U.S. Department of Agriculture, Washington, D.C. 20250.

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